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EXAMINER

DI VERDI, M

ART UNIT

PAPER NUMBER

1755

DATE MAILED:

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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/216,594

Applicant(s)
Gregory T. Whiteker et al.

Examiner
Michael J. DiVerdi

Group Art Unit
1755



☒ Responsive to communication(s) filed on Sep 13, 2000

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claim

☒ Claim(s) 1-76 is/are pending in the application.

Of the above, claim(s) 55-76 is/are withdrawn from consideration.

☒ Claim(s) 40 and 41 is/are allowed.

☒ Claim(s) 1-6, 8-10, 13, 15-39, and 42-54 is/are rejected.

☒ Claim(s) 7, 11, 12, and 14 is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☒ None of the CERTIFIED copies of the priority documents have been
☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s) _____.

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

— SEE OFFICE ACTION ON THE FOLLOWING PAGES —

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DETAILED ACTION

Continued Prosecution Application

1. The request filed on September 13, 2000 for a Continued Prosecution Application (CPA) under 37 CFR 1.53(d) based on parent Application No. 09/216,594 is acceptable and a CPA has been established. An action on the CPA follows.

Election/Restriction

2. Restriction to one of the following inventions is required under 35 U.S.C. 121:
- I. Claims 1-54, drawn to a catalyst system, classified in class 502, subclass 103+.
 - II. Claims 55-72, drawn to a polymerization process, classified in class 526, subclass 110+.
 - III. Claims 73 and 75, drawn to a compound, classified in class 556, subclass 1+.
 - IV. Claims 74 and 76, drawn to a process of screening, classified in class 526, subclass 348.
3. The inventions are distinct, each from the other because of the following reasons:
- Inventions of Group I and Group II are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP

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§ 806.05(h)). In the instant case the product as claimed can be used in a materially different process such as isomerization or hydrogenation of alkenes.

4. Inventions of Group III and Group I are related as mutually exclusive species in an intermediate-final product relationship. Distinctness is proven for claims in this relationship if the intermediate product is useful to make other than the final product (MPEP § 806.04(b), 3rd paragraph), and the species are patentably distinct (MPEP § 806.04(h)). In the instant case, the intermediate product is deemed to be useful as UV absorbers and the inventions are deemed patentably distinct since there is nothing on this record to show them to be obvious variants. Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions anticipated by the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

5. Inventions of Group II and Group IV are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions.

6. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper. Furthermore, because these inventions are distinct for the

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reasons given above and the search required for one Group is not required for other Groups, restriction for examination purposes as indicated is proper.

7. During a telephone conversation with Mr. Jaimes Sher on February 8, 2000 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-54. Affirmation of this election must be made by applicant in replying to this Office action. Claims 55-76 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

8. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(I).

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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10. Claims 1, 2, 13, 15-19, 22, 27, 28, 34, 35, 37, 38, and 50 are rejected under 35 U.S.C. 102(b) as being anticipated by Milani *et al.* (*Inorganica Chimica Acta*, 103, 1985, 15-18).

Milani *et al.* disclose a catalytic system comprised of a non-bridging *bis* and *tris* salicylimino vanadium compound and an alkyl aluminum activator. See page 16, Table 1, second and third set of experiments, as well as the first paragraph. Thus, the heteroatom group ortho to the oxygen of the phenoxide is an imine bound to the vanadium. The oxidation state of the *tris*-(salen) vanadium complex is +3, and the oxidation state of the *bis*-(salen) vanadium oxide complex is +4. The molar ratio of transition metal complex to dialkylaluminum activator is 2:1. See page 16, paragraph one. The R groups on the phenoxide ring are all hydrogens and therefore do not form a five membered ring.

11. Claims 1, 2, 13, 15, 16, 19, 20, 21, 29, 38, and 50 are rejected under 35 U.S.C. 102(b) as being anticipated by Kelsey (U.S. Patent No. 5,278,305).

Kelsey discloses a catalytic system comprised of a tungsten oxytetrachloride and 2,5-di-*t*-butyl-1,4-hydroquinone complex and a cocatalyst of tributyltin hydride (TBTH) and trifluoroboron. See column 7, Examples 1-16, lines 67-68 and continued into column 8, lines 1-15. Also see example 2 in the table of column 8. Thus the heteroatom group on the phenoxide is a hydroxy group, the activator is a non-coordinating anion (tributyl tin), R¹ is the tertiary alkyl group *t*-butyl, the Q group on the metal catalyst is chloride, and the R groups on the phenoxide ring do not form a five membered ring.

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Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103© and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

13. Claims 1-6, 8, 9, 15, 16-27, 29-32, 38, 39, 42-48, and 50-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bansleben *et al.* (WO 98/42664).

Bansleben *et al.* teach a group IVB metal (titanium, zirconium, or hafnium) salen catalyst that can be used for olefin polymerization with a co-catalyst in the form of methylaluminoxane or a trialkyl aluminum. See page 5, formula (I), page 8, lines 12-18, and page 13, lines 32-34. The catalyst may also be supported. See page 22, lines 16-21. The R¹ group is preferably a tert-butyl group. See page 5, lines 28-29. The R² group is taught to be a C₁-C₁₁ alkyl, or along with R¹ can

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form a carbocyclic ring. See page 6, lines 22-27. The Q group (R^6 in the reference) is defined as a phenyl, hydrogen, or halide. See page 7, lines 19-23. Bansleben *et al.* fail to disclose an example of the above described catalyst. It would have been obvious to one ordinarily skilled in the art of transition metal catalysis to prepare such a catalyst. The motivation would have been that such a catalyst is fairly taught by Bansleben *et al.*

14. Claims 33 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bansleben *et al.* in view of Tachikawa *et al.* (U.S. Patent No. 4,686,199), Lee *et al.* (U.S. Patent No. 4,405,495), and Chamla *et al.* (EP 0 453 088).

Bansleben *et al.* is being relied upon for the same reasons as applied to claims 1-6, 8, 9, 15, 16-27, 29-32, 38, 39, 42-48, and 50-54 above. Bansleben *et al.* fail to disclose dehydrating either partially or completely the support for the catalyst. It is well known in the art of supported catalysts that water acts as a poison and that the support material should be at least partially dehydrated if not completely dehydrated. Therefore it would have been obvious to one ordinarily skilled in the art of supported catalysts to dehydrate the support by any of the known means. The motivation would have been a higher catalytic activity by removing the poison water. See for example Tachikawa *et al.*, column 2, lines 5-35, Lee *et al.*, column 5, lines 51-53, and Chamla *et al.*, page 3, lines 43-46.

15. Claims 1, 2, 15-17, 22, 29, 30, 34, 35, 37, 38, and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Klabunde (U.S. Patent No. 5,030,606).

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Klabunde teaches a nickel phosphine substituted phenoxide catalyst system comprised of an aluminum alkyl co-catalyst. See column 3, lines 49-66, especially where R⁵ and R⁶ are defined as forming an aromatic ring, and E is defined as a phosphine atom in column 2, lines 41-67. In this case the phosphine acts as the heteroatom group off of the phenoxide ring and is bound to the nickel center. The Q group (R³ in the reference) is defined as either a hydride or C₁₋₂₀ hydrocarbyl group. See column 2, lines 42-43. The molar ratio of transition metal to aluminum alkyl activator is from 100-0.5:1. See column 5, lines 31-33. This range overlaps the current claim 34, 35, and 37 ranges. Overlapping ranges have been held to establish *prima facie* obviousness. MPEP 2144.05. Klabunde fails to disclose an example of the above described catalyst. It would have been obvious to one ordinarily skilled in the art of transition metal catalysis to prepare such a catalyst. The motivation would have been that such a catalyst is fairly taught by Klabunde.

16. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson *et al.* (U.S. Patent No. 5,714,556).

Johnson *et al.* teach a nickel catalyst system comprised of a heteroatom substituted phenoxide and a borane activator in the form of HBAF. See column 1, lines 38-46, compound (XVII) in line 55, column 3, lines 14-19 for a definition of the R groups off of the phenoxide, and column 15, lines 5-10 for a list of the preferred activators. Johnson *et al.* fail to disclose an example of the above described catalyst. It would have been obvious to one ordinarily skilled in

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the art of transition metal catalysis to prepare such a catalyst. The motivation would have been that such a catalyst is fairly taught by Johnson *et al.*

17. Claims 1-3, 9, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zum Mallen (U.S. Patent No. 5,962,361).

Zum Mallen teaches a Ziegler-Natta catalyst comprised of a titanium metal atom, a heteroatom substituted phenoxide, and an aluminum alkyl cocatalyst. See column 5, lines 34-40, and lines 59-62, where 3-methoxyphenol and 3-dimethylaminophenol are preferred phenoxides. In the Zum Mallen invention a magnesium alkoxide acts as a solid support. See column 6, lines 18-21, and lines 41-44. Zum Mallen fails to disclose an example of the above described catalyst. It would have been obvious to one ordinarily skilled in the art of transition metal catalysis to prepare such a catalyst. The motivation would have been that such a catalyst is fairly taught by Zum Mallen.

18. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kelsey (U.S. Patent No. 5,278,305).

Kelsey teaches a catalytic system comprised of a tungsten oxytetrachloride and 2,5-di-*t*-butyl-1,4-hydroquinone complex and an activator having the formula $[Y^+][BH_mZ_n]^-$ where Z is a substituent group such as alkyl making it a borane. See column 7, Examples 1-16, lines 67-68 and continued into column 8, lines 1-15, and column 3, lines 43-48. The amount of activator taught is from 15:1 to 1:1 based on the transition metal. See column 4, lines 30-34. This range overlaps the current claim 36 range. Overlapping ranges have been held to establish *prima facie*

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obviousness. MPEP 2144.05. Kelsey fails to disclose an example of the above described catalyst. It would have been obvious to one ordinarily skilled in the art of transition metal catalysis to prepare such a catalyst. The motivation would have been that such a catalyst is fairly taught by Kelsey.

Allowable Subject Matter

19. Claims 40 and 41 are allowed.

Although a bridging salen zirconium catalytic system exists in the prior art, a non-bridging bis-salicylimino zirconium catalyst could not be found.


20. Claims 7, 11, 12, and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J. DiVerdi whose telephone number is (703) 305-0213. The examiner can normally be reached on Monday-Thursday from 7:00 AM to 5:00 PM. The examiner can also be reached on alternate Fridays.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Bell, can be reached on (703)308-3823. The fax phone number for the organization where this application or proceeding is assigned is (703)305-3599.

Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0661.



Mark L. Bell
Supervisory Patent Examiner
Technology Center 1700

Michael J. DiVerdi

September 19, 2000